

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

---

A NEW EURYHALINE SPECIES OF *PARAPLEUSTES*  
(AMPHIPODA) FROM THE EAST COAST  
OF NORTH AMERICA

BY LES WATLING AND DON MAURER  
*College of Marine Studies, University of Delaware,  
Lewes, Delaware 19958*

From mid 1968 to the present we have been engaged in a survey of the benthic fauna of the Delaware Bay region. In Delaware Bay we have been concerned chiefly with the oyster community (Maurer et al., 1971, Maurer and Watling, in press) while in the smaller Indian River and Rehoboth bays along Delaware's ocean coast, the total benthic community is being studied. Thus far we have described the amphipod and hydroid faunas (Watling and Maurer, 1972a, 1972b) and have discussed factors influencing the distribution of the associated oyster fauna (Maurer and Watling, in press).

During these investigations an amphipod belonging to the genus *Parapleustes* was found, sometimes in very great abundance. We were advised by E. L. Bousfield (National Museums of Canada) that this was an undescribed species and that Feeley and Wass (1971, as *Parapleustes* sp.) and R. L. Cory (1967, as Amphipod species A) had encountered this species in the Patuxent River, Maryland, and that R. Heard had found this species in Georgia. The present paper is a description of this new amphipod.

***Parapleustes aestuarius*, new species**

Figures 1-4

*Diagnosis:* Body without dorsal processes; antenna 1 at least as long as first 5 pereonites; interantennal lobe bluntly rounded; fifth article of gnathopods with posterior lobe; 3 clusters of spines delimit the palms of the gnathopods; coxae 1-3 with 3 or 4 posteroventral notches.

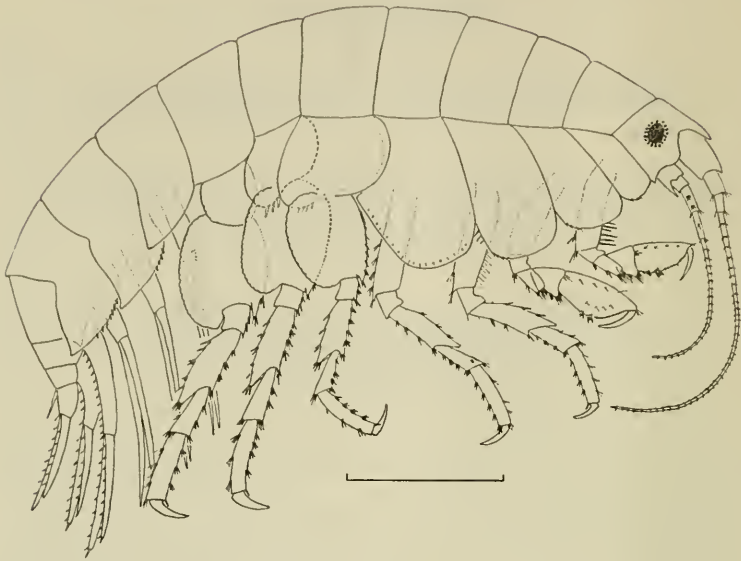


FIG. 1. *Parapleustes aestuarius*, new species, female. Scale equals 1.0 mm.

*Description:* Female; 3.5–6.0 mm: Interantennal lobe bluntly rounded; rostrum short, extending along  $\frac{1}{4}$  of antenna 1 peduncle article 1; eye circular, black.

Antenna 1 at least as long as first 5 pereonites, generally as long as entire pereon; peduncle article 3 shorter than article 2, article 1 wider at base than at distal end. Antenna 2 shorter than antenna 1; peduncle article 2 with gland cone projecting beyond article 3; peduncle articles 4 and 5 subequal.

Mouthparts as illustrated. Mandible molar a small, smooth protuberance; inner side of mandible palp article 3 with many fine sharply pointed setae, lower margin with 9 strong serrated spines. Maxilliped palp article 3 not distally produced.

Gnathopod 2 slightly larger than gnathopod 1. Article 5 on both pairs of gnathopods with distally directed posterior lobe; sixth articles with palm delimited by cluster of short, strong spines; palms with short setae, and often with single, bluntly rounded, minute tooth midway along its length; this tooth more frequently absent from gnathopod 2 than gnathopod 1.

Coxal plates 1–3 of ovigerous females each with 3–4 distinct notches on posteroventral corners. Pereopods 1 and 2 with clusters of strong spines on posterior margins, and clusters of setae on anterior margins of articles 4–6. Pereopods 3–5 with spine clusters on anterior margins

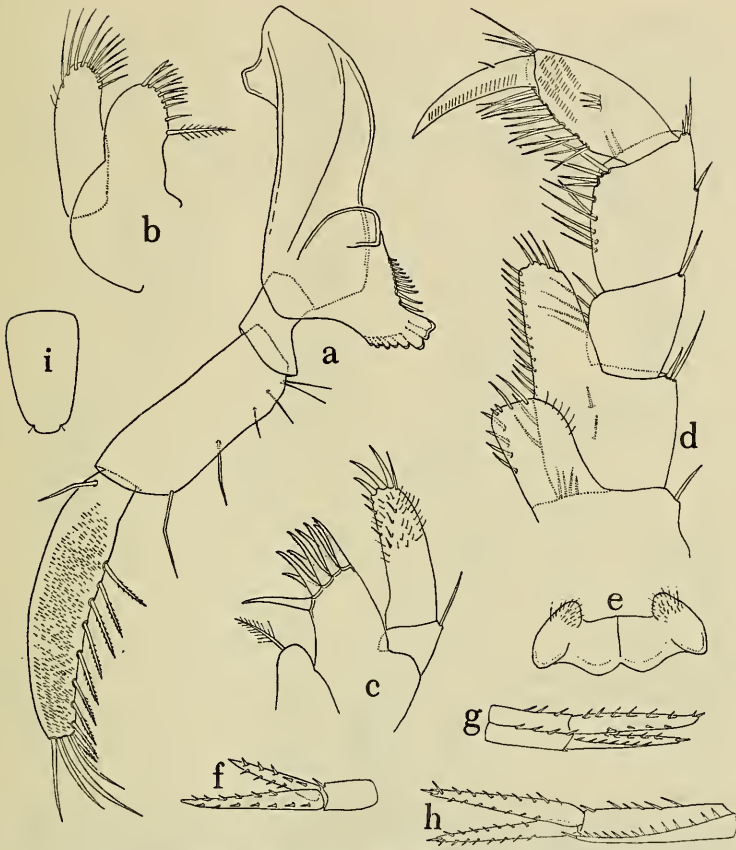


FIG. 2. *Parapleustes aestuarius*, new species: a, mandible; b, maxilla 2; c, maxilla 1; d, maxilliped; e, lower lip; f, uropod 3; g, uropod 2; h, uropod 1; i, telson.

and setal clusters on posterior margins of articles 4-6. All pereopods with a small, plumose seta on ventroproximal corner of article 7.

Pleon side plate 3 posterior margin slightly sinuous, ventrally acuminate; anterior part of ventral margin with 7 setae. Pleon side plate 2 with 4 setae. Uropods 1-3 outer ramus distinctly shorter than inner. Uropod 3 peduncle without dorsal spines; uropods 1 and 2 with 2 dorsal rows of spines on peduncle; uropod 1 peduncle nearly as long as rami. Telson entire, with a pair of subapical setae.

Male; 3-4 mm: Almost indistinguishable from female; body not so robust. Gnathopod 1 with much stronger tooth and fewer setae on

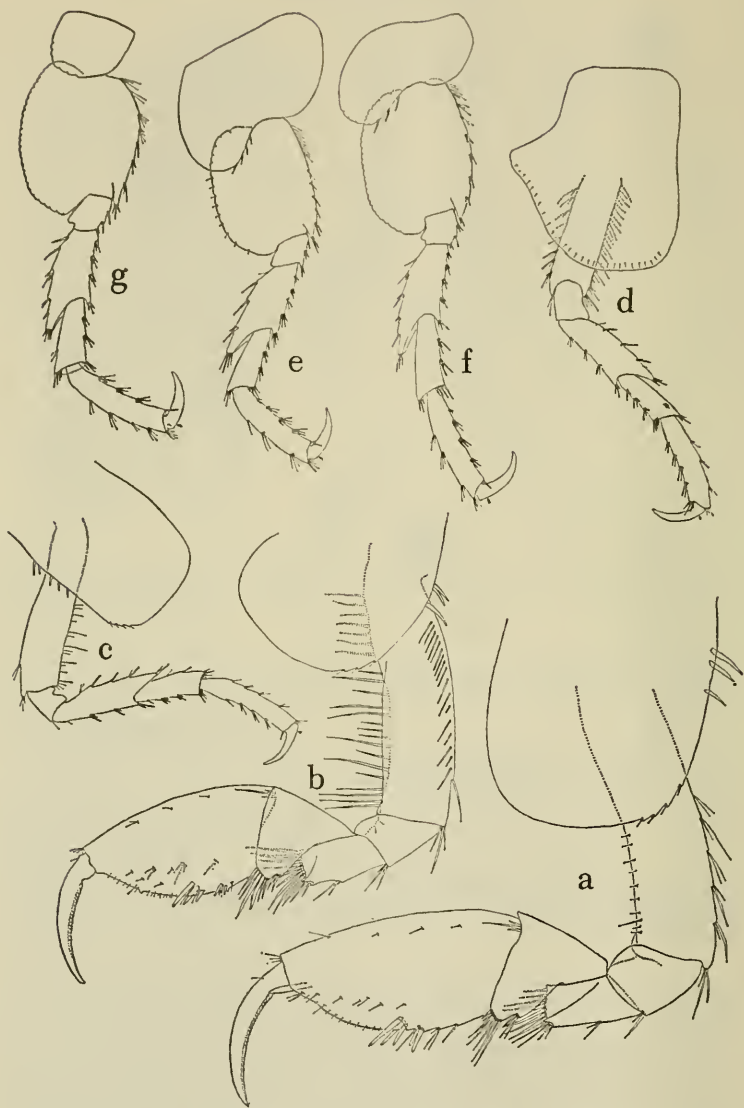


FIG. 3. *Parapleustes aestuarius*, new species: a, gnathopod 2; b, gnathopod 1; c, pereopod 1; d, pereopod 2; e, pereopod 3; f, pereopod 4; g, pereopod 5.

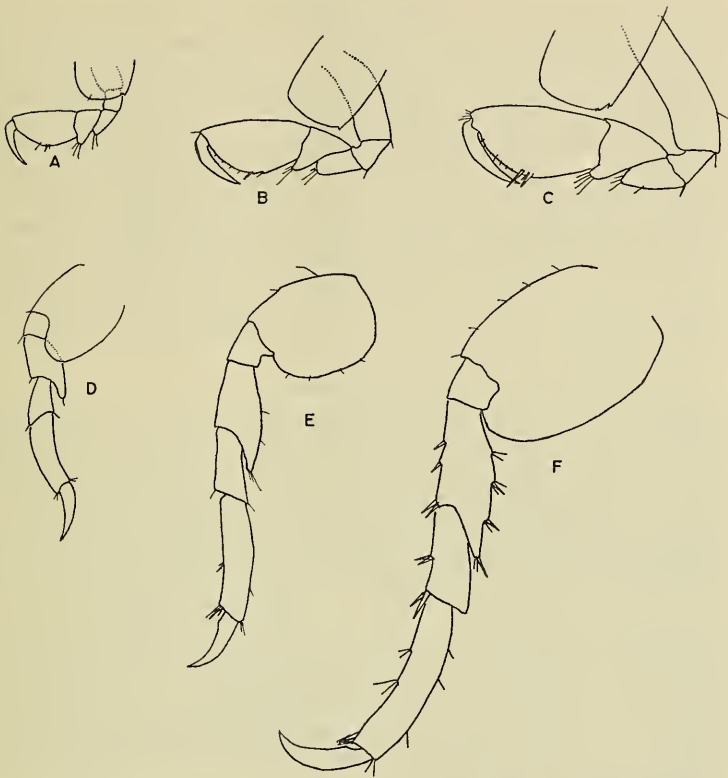


FIG. 4. *Parapleustes aestuarius*, new species: a-c, second gnathopods from 1.2 mm, 2.0 mm, and 2.5 mm specimens respectively; d-f, fifth pereopods from the same specimens; all appendages drawn at the same magnification.

palm; article 5 with distally directed posterior lobe more pronounced, without penultimate setal cluster on posterior margin. Gnathopod 2 also with stronger tooth and fewer setae on palm; article 5 with distally directed posterior lobe more pronounced; article 4 without setae on posterior margin. Pleon side plate 3 with 4 setae on ventral margin.

*Holotype*: USNM No. 140942; female, ovigerous.

*Paratypes*: USNM No. 139522; female, dissected, from the Broadkill River, Delaware; USNM No. 139523 from the Broadkill River, Delaware, about 25 individuals; USNM No. 139524, collected by R. Heard from Sapelo Island, Georgia, about 25 individuals.

*Type-locality*: Broadkill River, Delaware, latitude 38° 30' 00" N., longitude 75° 12' 00" W.; recorded salinity range 10 ‰ to 33 ‰; re-

corded temperature range  $-1.8^{\circ}\text{C}$  to  $28.9^{\circ}\text{C}$ ; recorded dissolved oxygen range 0.7 mg./l.-9.5 mg./l.; depth 3-5 m; specimens collected from the bases of hydroids attached to oysters.

*Distribution:* No other species of *Parapleustes* has thus far been described from the east coast of North America south of Cape Cod. This new species has been found from Delaware Bay, Delaware, the Patuxent River, Maryland (George Abbe, Benedict Estuarine Laboratory, personal communication; R. L. Cory (1967) and Nauman and Cory (1969)), the York River, Virginia (Feeley and Wass, 1971) and from Sapelo Island, Georgia (Richard Heard, personal communication). Feeley and Wass (1971) found this species to be rare in the York River, but Cory (1967) found it to be abundant on his fouling plates in the Patuxent River. It has been found in large numbers in our samples and in the samples sent to us by R. Heard.

*Relationships:* The presence of the small, non-tritulative mandibular molar, article 3 of the maxillipedal palp not being distally produced, and subchelate gnathopods are characteristic of the genus *Parapleustes* as defined by Barnard (1969). This new species possesses all these features. Within the genus its closest affinities appear to be with the type-species, *Parapleustes gracilis* Bucholz. *Parapleustes aestuarius* is distinguished from *P. gracilis* by the following characters: interantennal angle bluntly rounded rather than acute as in the latter species; there are 3 spines delimiting the palm of the gnathopods whereas in *P. gracilis* there are only 2 spine clusters; all appendages possess a larger number of spine clusters; the distally directed lobe on gnathopod article 5 more pronounced in females of *P. gracilis* than in female of *P. aestuarius*; antenna 1 is longer than the first four body segments; there is no accessory flagellum on antenna 1, though a minute (12 microns in length) scale is visible at high magnification. Sexton (1909) illustrated an accessory flagellum from Bucholz's specimens.

In figure 4 the second gnathopod and pereopod 5 have been illustrated from 3 specimens of undetermined sex measuring 1.2, 2.0, and 2.5 mm, respectively. The study of these and other specimens of different sizes illustrate the variability of some morphological features. While all diagnostic characters are present by the time the animal is sexually mature, some appear before others. As well, almost all features appear gradually on a cumulative basis. For example, the four teeth on the posteroventral corner of coxae 1-3 appear one at a time (Figure 4A-C) as do the spine clusters between the corners of the appendage articles. Laboratory reared specimens of other amphipods (Sexton, 1924, and Myers, 1971), and our own field-collected specimens demonstrate the gradual addition of flagellar articles to the antennae. Some characters, however, are present from the youngest stages. These are: 1) the spines which will become spine clusters on the corners of the pereopod articles; 2) the distalmost spine delimiting the palm of the gnathopod; and 3) a minute plumose seta (not included in the figures) near the proximal-posterior corner of the dactyl of all pereopods.

## ACKNOWLEDGMENTS

The authors thank Dr. E. L. Bousfield of the National Museum of Canada who has aided in all of our amphipod studies. We also express our appreciation to Dr. Richard Heard of the University of Georgia and Mr. George Abbe of the Benedict Estuarine Laboratory in Maryland who sent specimens to us. We appreciate also the time spent by Dr. Scott Gray and Dr. J. L. Barnard who reviewed the manuscript.

This work was supported in part by the National Oceanographic and Atmospheric Administration Sea Grant program, National Marine Fisheries Service Public Law 88-309, and the Delaware Department of Natural Resources and Environmental Control.

This study is contribution number 79 from the University of Delaware, College of Marine Studies.

## LITERATURE CITED

- BARNARD, J. L. 1969. The families and genera of marine gammaridean Amphipoda. Bull. U. S. Nat. Mus. 271:1-535.
- CORY, R. L. 1967. Epifauna of the Patuxent River estuary, Maryland, for 1963 and 1964. Chesapeake Sci. 8(2):71-89.
- FEELEY, J. B., AND M. L. WASS. 1971. The distribution and ecology of the Gammaridea (Crustacea: Amphipoda) of the lower Chesapeake estuaries. Virginia Inst. Mar. Sci., Spec. Papers Mar. Sci. No. 2:1-58.
- MAURER, D., AND L. WATLING. In press. Studies on the oyster community in Delaware: the effects of the estuarine environment on the associated fauna. Int. Rev. ges. Hydrobiol.
- , ———, AND R. KECK. 1971. The Delaware oyster industry: a reality? Trans. Amer. Fish. Soc. 100(1):100-111.
- MYERS, A. A. 1971. Breeding and growth in laboratory reared *Microdeutopus gryllotalpa* Costa (Amphipoda: Gammaridea). J. Nat. Hist. 5:271-277.
- NAUMAN, M., AND R. L. CORY. 1969. Thermal additions and epifaunal organisms at chalk point, Maryland. Chesapeake Sci. 10(3 & 4):218-226.
- SEXTON, E. W. 1909. Notes on some Amphipoda from the north side of the Bay of Biscay. Families Pleustidae and Eusiridae. Proc. Zool. Soc., London, 1909:848-879.
- . 1924. The moulting and growth stages of *Gammarus* with descriptions of the normals and intersexes of *Gammarus chevreuxi*. J. Mar. Biol. Assoc., U. K. 13:340-401.
- WATLING, L., AND D. MAURER. 1972a. Shallow water amphipods of the Delaware Bay region. Crustaceana Suppl. 3:251-266.
- , AND ———. 1972b. Shallow water hydroids of the Delaware Bay region. J. Nat. Hist. 6:643-649.